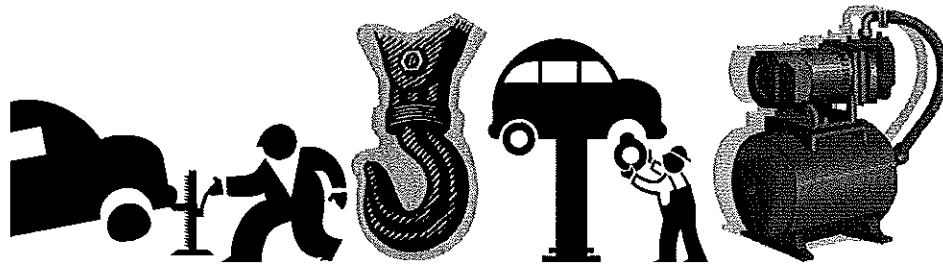


# **Jacks/Hoists/Auto Lifts/Air Compressors Safety**



## **Jacks/Hoists/Auto Lifts/Air Compressors Safety Program**

### **Included:**

**Standards on Jacks**

**Standards on Hoists**

**Standards on Auto Lifts**

**Standards on Air Compressors**

**Equipment Inspection Record (blank original)**

## Jacks





**U.S. Department of Labor**  
Occupational Safety & Health Administration

**[www.osha.gov](http://www.osha.gov)**

Search   [Advanced Search](#) | [A-Z Index](#)

**Regulations (Standards - 29 CFR)**

**Other portable tools and equipment. - 1910.244**

**[Regulations \(Standards - 29 CFR\) - Table of Contents](#)**

• <b>Part Number:</b>	1910
• <b>Part Title:</b>	Occupational Safety and Health Standards
• <b>Subpart:</b>	P
• <b>Subpart Title:</b>	Hand and Portable Powered Tools and Other Hand-Held Equipment
• <b>Standard Number:</b>	<u>1910.244</u>
• <b>Title:</b>	Other portable tools and equipment.

**1910.244(a)**

Jacks -

**1910.244(a)(1)**

Loading and marking.

**1910.244(a)(1)(i)**

The operator shall make sure that the jack used has a rating sufficient to lift and sustain the load.

**1910.244(a)(1)(ii)**

The rated load shall be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

**1910.244(a)(2)**

Operation and maintenance.

**1910.244(a)(2)(i)**

In the absence of a firm foundation, the base of the jack shall be blocked. If there is a possibility of slippage of the cap, a block shall be placed in between the cap and the load.

**1910.244(a)(2)(ii)**

The operator shall watch the stop indicator, which shall be kept clean, in order to determine the limit of travel. The indicated limit shall not be overrun.

**1910.244(a)(2)(iii)**

After the load has been raised, it shall be cribbed, blocked, or otherwise secured at once.

Other portable tools and equipment. - 1910.244

**..1910.244(a)(2)(iv)**

**1910.244(a)(2)(iv)**

Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

**1910.244(a)(2)(v)**

All jacks shall be properly lubricated at regular intervals.

**1910.244(a)(2)(vi)**

Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections shall be not less frequent than the following:

**1910.244(a)(2)(vi)(a)**

For constant or intermittent use at one locality, once every 6 months,

**1910.244(a)(2)(vi)(b)**

For jacks sent out of shop for special work, when sent out and when returned,

**1910.244(a)(2)(vi)(c)**

For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

**1910.244(a)(2)(vii)**

Repair or replacement parts shall be examined for possible defects.

**1910.244(a)(2)(viii)**

Jacks which are out of order shall be tagged accordingly, and shall not be used until repairs are made.

**..1910.244(b)**


**1910.244(b)**

Abrasive blast cleaning nozzles. The blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

[39 FR 23502, June 27, 1974, as amended at 49 FR 5323, Feb. 10, 1984]

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 [Next Standard \(1910 Subpart Q\)](#)

 [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

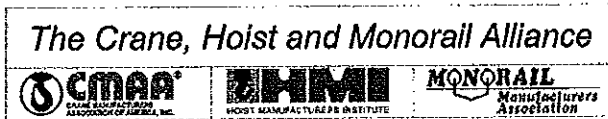
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## Hoists



## HOIST AND AUXILIARY EQUIPMENT

- Is each overhead electric hoist equipped with a limit device to stop the hook at its highest and lowest point of travel?
- Will each hoist automatically stop and hold any load up to 125 percent of its rated load if its actuating force is removed?
- Is the rated load of each hoist legibly marked and visible to the operator?
- Are stops provided at the safe limits of travel for trolley hoists?
- Are the controls of hoists plainly marked to indicate the direction of travel or motion?
- Is each cage-controlled hoist equipped with an effective warning device?
- Are close-fitting guards or other suitable devices installed on each hoist to ensure that hoist ropes will be maintained in the sheave grooves?
- Are all hoist chains or ropes long enough to handle the full range of movement of the application while maintaining two full wraps around the drum at all times?
- Are guards provided for nip points or contact points between hoist ropes and sheaves permanently located with 7 feet (2.1336 meters) of the floor, ground, or working platform?
- Are employees prohibited from using chains or rope slings that are kinked or twisted and prohibited from using the hoist rope or chain wrapped around the load as a substitute for a sling?
- Is the operator instructed to avoid carrying loads above people?



## **Fact Sheet No. 1: Proper Inspection and Maintenance of Overhead Cranes and Hoists**

*This is the first in a series of Fact Sheets developed by the Crane, Hoist and Monorail Alliance concerning safe application and operation of overhead material handling equipment.*

### **Why is overhead crane and hoist inspection important?**

Crane inspection and maintenance are essential to safe equipment operation. Operator safety can be improved and operator injury can be avoided if the equipment is properly inspected and maintained. In addition, manufacturing productivity can also be improved with scheduled maintenance to maintain proper equipment functionality and to help avert breakdown repairs. Failure to complete overhead crane and hoist inspections and proper equipment maintenance could lead to serious injury, death or destruction of property.

### **What are the standards for overhead hoist and crane inspection and maintenance?**

The standards and reference manuals for the required proper inspection of overhead cranes and hoists are:

- 1) Occupational Safety & Health Administration – 29 CFR Part 1910.179 Overhead and Gantry Cranes
- 2) The American Society of Mechanical Engineers – B30.2 - 2005 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist); B30.16 - 2003 Overhead Hoists (Underhung); B30.17 - 2003 Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
- 3) Canadian Standards Association – CAN/CSA B167-96 (R2002) Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists and Trolleys.
- 4) Crane Manufacturers Association of America – CMAA Specification 78 - Standards and Guidelines for Professional Services Performed on Overhead Traveling Cranes and Associated Hoisting Equipment
- 5) State and local codes.
- 6) Manufacturers' Operations Manual.

These standards and reference manuals outline the frequency of inspection, the items that shall be inspected, who shall conduct the inspection, and how to document the inspection.

### **How can you protect your workers?**

You can protect your workers by:

- Implementing a written and documented crane and hoist inspection and maintenance program.
- Training the operator to perform the required pre-shift inspection of the equipment.
- Training the operator to properly use the equipment.
- Ensuring that the operator has read the manufacturers' operation manuals.

### **What do employees/operators need to know?**

- Proper pre-shift inspection techniques and items to be inspected. See Safety Tips Sheet No. 2.
- Proper use of the equipment.
- Contents of manufacturers' operations manual.
- Lock out/Tag out procedure.
- How to document the inspections.
- Who to contact in the event that a product requires service or repair.



## Hoist Basics

Some basic information about hoists is presented here. More in-depth information is available in the various manuals published by HMI [<http://www.mhiastore.org/category.cfm?Category=40>]

**AN OVERHEAD HOIST IS A MACHINE USED FOR VERTICAL LIFTING OF MATERIAL (NOT PEOPLE) THAT IS FREELY SUSPENDED (UNGUIDED).**

**A MANUALLY LEVER OPERATED HOIST IS A DEVICE USED TO LIFT, LOWER, OR PULL A LOAD (NOT PEOPLE), AND TO APPLY OR RELEASE TENSION TO ITEMS.**

Hoists can provide lifting and lowering motions in an overhead material handling system. When a hoist is mounted to a trolley on a fixed monorail, two directions of load motion are available: forward or reverse, up or down. When the hoist is mounted on a crane, three directions of load motion are available: right or left, forward or reverse, up or down. These systems can achieve straight-line moves, reduce material damage, reduce noise, minimize energy cost, reduce floor-based traffic, improve worker ergonomics, and accomplish other operational objectives.

Usually, a hoist is not a piece of stationary hardware. It is generally available for use whenever required and rarely requires a full time operator. Hoists can be integrated into a variety of automated handling systems.

In an overhead material handling system, hoists provide vertical movement of below-the-hook load supporting and positioning devices.

In any material handling system, the hoist is used to accurately position a load.

The majority of hoists used in the United States are classified as Standard or "packaged hoists", typically defined as largely self-contained units, prepared to be installed on existing structures. They are selected and installed into an application, often as part of a system. These systems vary greatly from simple, manually controlled systems to complex integrated and automated systems involving sophisticated components and controls. Hoists can be powered manually, with air, hydraulics, or electricity. Trolley selection is dictated by system requirements.

This publication does not specifically address "Built-up Hoists", which may be covered by other standards, more crane related.

## **Types of Overhead Hoists**

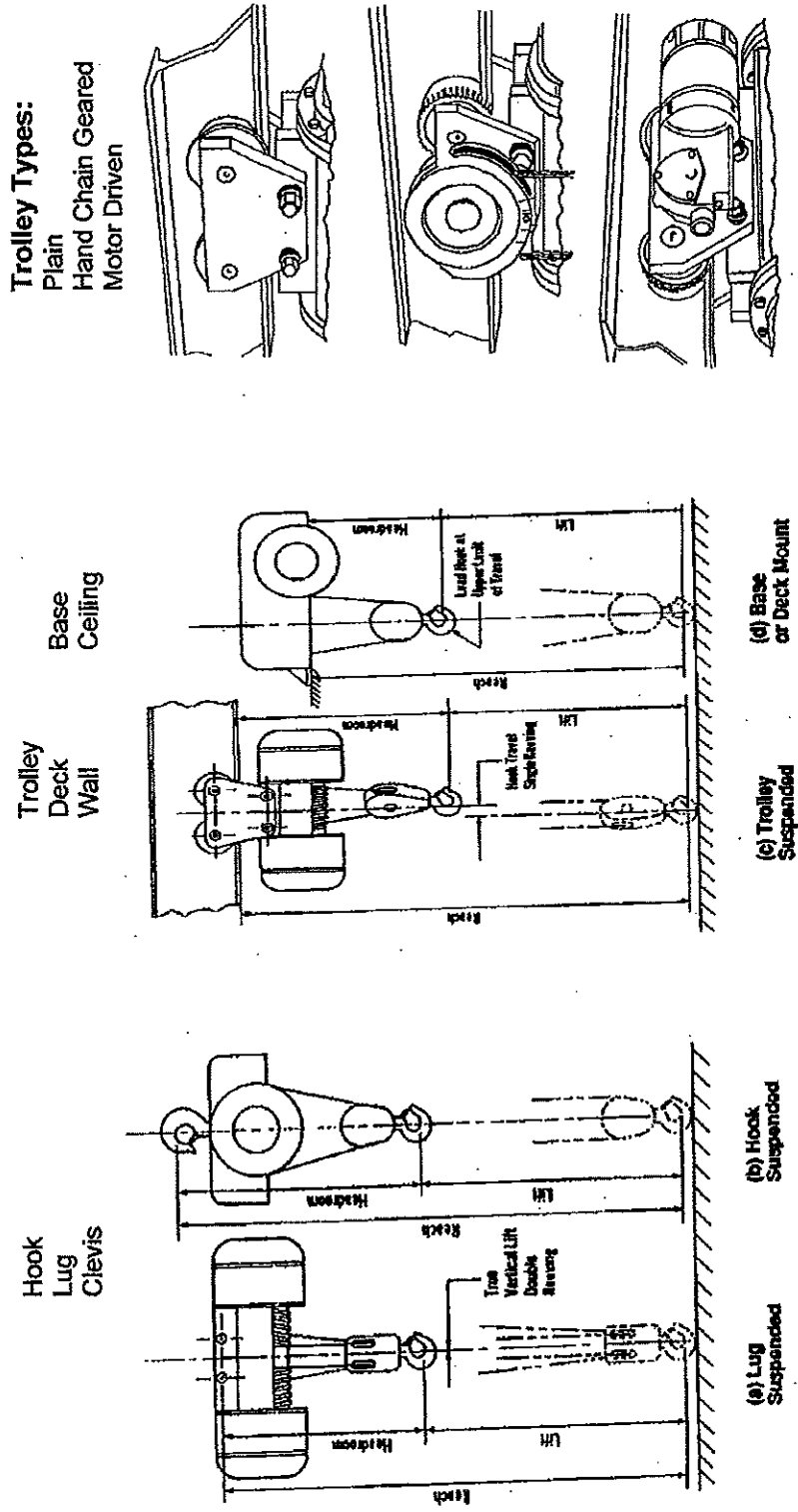
These hoists are defined by:

- Mounting Type – There are eight suspension/mounting methods for overhead hoists: Hook Mounted, Clevis Mounted, Lug Mounted, Trolley Mounted, Deck Mounted, Base Mounted, Wall Mounted, and Ceiling Mounted.
- Lifting Medium – Four types of lifting medium for overhead hoists: Welded Link Chain, Roller Load Chain, and Wire Rope, synthetic web or rope material.
- Power Application – Three methods of applying power for overhead hoists: Manually by Hand Chain, Electric Power, and Air Power.



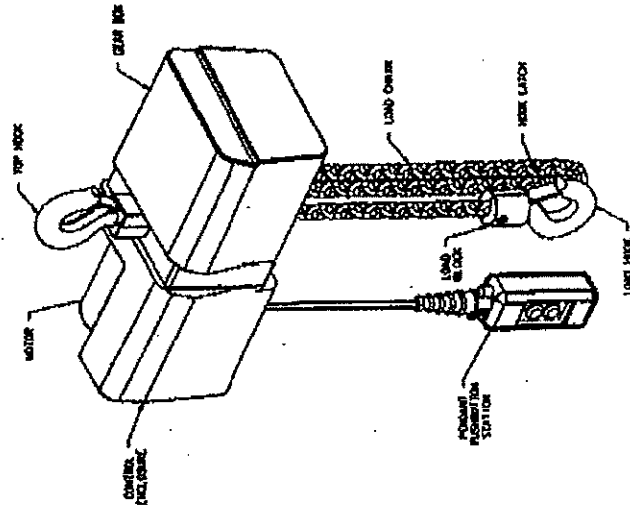
# Overhead Hoist Mounting Types

Hoist mounting selection depends upon the requirements of the application and must be considered in conjunction with other lifting considerations.

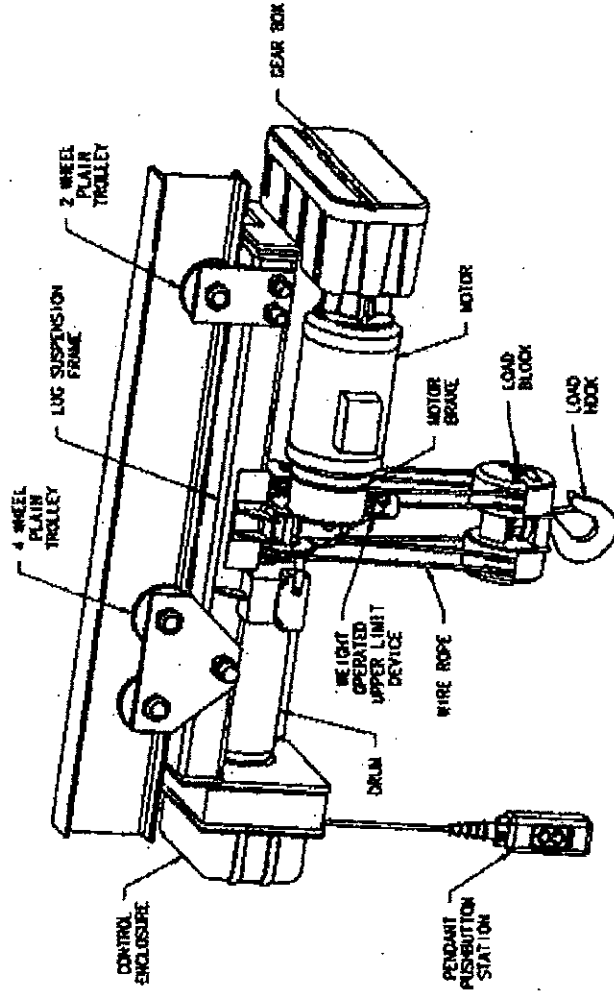


## Overhead Hoist Lifting Media

Welded Link Chain (Roller Load Chain not shown)



## Wire Rope

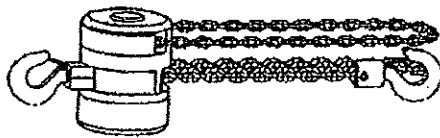


## Overhead Hoist Power Application

### Manual, by Hand Chain

### Electric

Electric is the most common power source



### Pneumatic

Pneumatic power is often required in applications of high speed, higher duty cycle involving rapid, repetitive tasks or hazardous areas where electric power is inadvisable.

### Supply Equipment Options

Power supply and control cords, cord reels, hoses, electrification systems, and flexible festooning systems provide means for supplying power to hoists. Such systems must be properly sized and meet all prevailing codes or regulations

### Control Options

A wide range of pendant and remote controls are available to provide suitable and convenient positioning for the operator.

## Operational Considerations

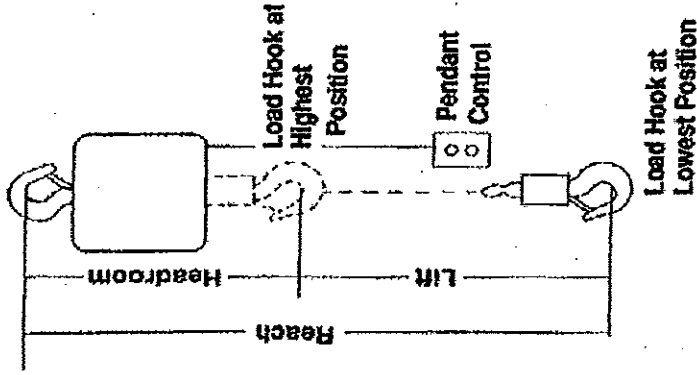
Hoist operators should be trained in the proper use of all hoisting equipment. Many accidents occur because operators simply do not know that they are doing something dangerous. Refer to the manufacturer's parts, maintenance and operating documents.

ASME B30.16 deals with equipment and the workplace safety issues, which apply to all overhead hoists that lift freely suspended unguided loads.

## Lifting Considerations

To select the proper hoist, consider:

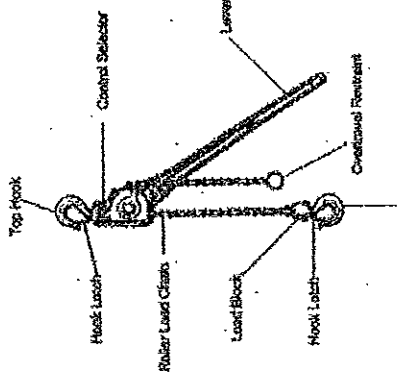
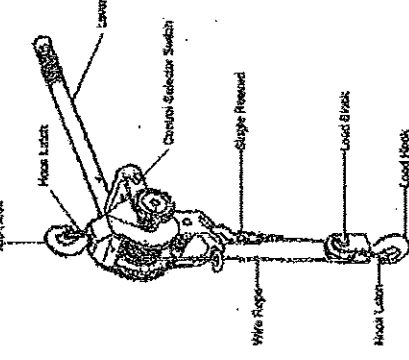
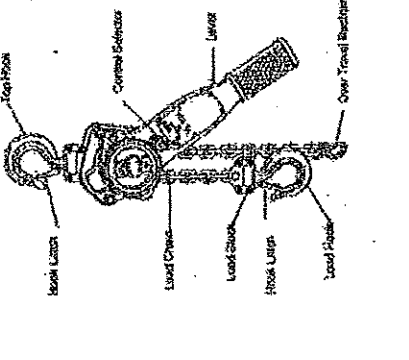
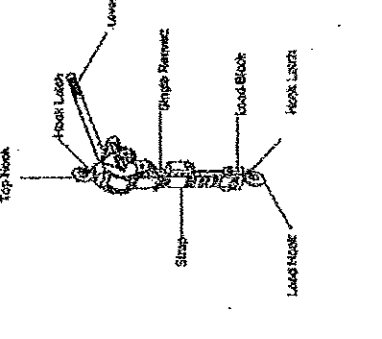
- A. The weight of the load to be lifted including below-the-hook lifting, load supporting, and positioning devices.
- B. Physical size of the load.
  1. Holding and orienting devices.
  2. Design for center of gravity (control & stability).
- C. Lift – the vertical distance the load can be moved.
- D. Clearance Considerations.
  1. Headroom
  2. Obstacles to be cleared during the load transfer.
  3. Design for vertical lift required including holding device height.
- E. Lifting Speed Considerations.
  1. Distance the load is to be raised and lowered
  2. Frequency of usage
  3. Required positioning accuracy
  4. Nature of the load being lifted
- F. Hoist duty Cycle Considerations based on:
  1. Number of lifts per hour
  2. Total number of lifts per shift
  3. Maximum number of starts and stops per hour
  4. Number of shifts per day
  5. Average distance load is raised and lowered
  6. Average weight to be lifted
  7. Maximum weight to be lifted
  8. Frequency of lifts with maximum weight.



## Types of Manually Lever Operated Hoists

These manually lever operated hoists are defined by four types of lifting media:

- Roller Load Chain
- Welded Link Chain
- Wire Rope
- Web Strap.

	
	
<p>Link Chain Ratchet Lever Hoist</p>	<p>Wire Rope Ratchet Level Hoist</p>
<p>Link Chain Ratchet Lever Hoist</p>	<p>Strap Ratchet Lever Hoist</p>

## Balancers

These overhead devices provide and perform functions different from overhead hoist in that they can lift, lower and float a load. The balancer configurations and suspensions are similar to a hoist.

The balancer functions differently from a hoist. The functional difference is indicated in the name: balancer. A balancer balances the load in a near weightless condition during the lifting operation. This feature allows the operator to maneuver the load easily.

Balancers are often used for awkward and / or rapid load movements. Balancers can also be used to suspend equipment, which is used in repetitive operation.

A variety of control options are available.

A very broad range of load handling devices (end effectors) can expand this product's versatility.

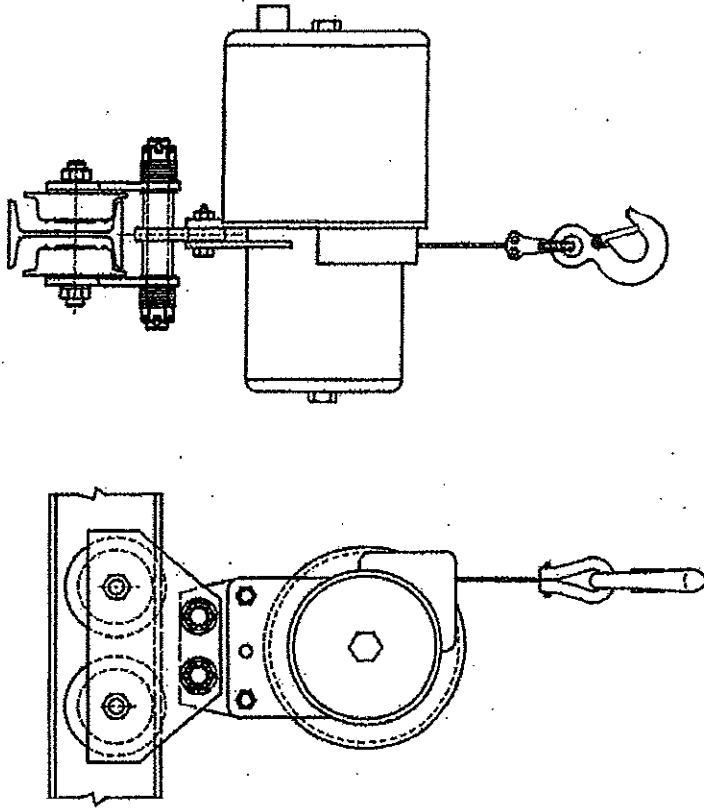
Balancers are typically supported on small jibs, light monorail systems, or enclosed track monorail systems.

### Equipment Characteristics

Vertical lift only

Max. Lifting Capacity: 500 pounds, approx.

Weight: 100 pounds, approx.



Balancers may or may not have been historically designed with hoist standards applied. Work is presently under way by the ASME B30 committee to prepare a safety standard for balancers. When available this standard will be released at B30.28

## **Hoist Standards**

There are many standards produced by many different standards-writing bodies. In an ever-shrinking world, hoist products increasingly pass across international borders. The list of standards referenced below is by no means complete, yet, in HMI's opinion, represents the standards that are applicable in different regions of the world. Since some of those standards may differ from the country to country, it is important for purchasers, installers, and users to know which ones apply for a particular situation.

## **USA**

In the USA, the American Society of Mechanical Engineers (ASME; website: [www.asme.org](http://www.asme.org)) publishes standards for hoists. Three are safety standards and six are performance standards. All carry the American National Standards Institute (ANSI) designator for a consensus American National Standard (ANS):

ASME-HST-1	Performance Standard for Electric Chain Hoists
ASME-HST-2	Performance Standard for Hand Chain Manually Operated Chain Hoists
ASME-HST-3	Performance Standard for Manually Lever Operated Chain Hoists
ASME-HST-4	Performance Standard for Overhead Electric Wire Rope Hoists
ASME-HST-5	Performance Standard for Air Chain Hoists
ASME-HST-6	Performance Standard for Air Wire Rope Hoists
ASME-B30.7	Safety Standard for Base Mounted Drum Hoists
ASME-B30.16	Safety Standard for Overhead Hoists (Underhung)
ASME-B30.21	Safety Standard Manually Lever-Operated Hoists

OSHA (Parts 1910 and 1926) adopts or invokes the American Society of Mechanical Engineers (ASME) HST Performance and B30 Safety Standards for hoists and related equipment.

Generally, for hoist installations in the US the standards published by the American Society of Mechanical Engineers apply.





## INTERNATIONAL

### NON-EUROPEAN

Outside North America, ISO (International Organization for Standardization) is sometimes referenced. For certain areas of the Asian markets the Japanese JIS standards may apply. Following is a selection of ISO and JIS standards applicable to hoists directly or through association with lifting machinery such as cranes:

### ISO STANDARDS

The International Organization for Standardization (ISO; website [www.iso.ch](http://www.iso.ch)) publishes many standards for numerous types of lifting machinery, many specifically for application, design, operation and maintenance of cranes. Below is a brief selection applicable to hoists and hoist components:

ISO 1837  
ISO 2374  
ISO 2408

Lifting Hooks - Nomenclature

Lifting Appliances - Range Of Maximum Capabilities for Basic Models

Steel Wire Rope for General Purposes

### JIS STANDARDS

The Japanese Industrial Standards Committee (JIS; website [www.jisc.go.jp](http://www.jisc.go.jp)) publishes standards for hoists. Some of the primary ones are:

JIS B 8802  
JIS B 8815  
JIS B 8819  
JIS C 9620

Manually Operated Chain Hoists

Electric Chain Hoists

Manually Operated Chain Lever Hoists

Electric Wire Rope Hoists

## EUROPEAN

Traditionally, European countries have maintained national standards in reference to a large number of industrial products, e.g. DIN (Germany), BSI (United Kingdom). In addition the FEM (Federation Europeenne de la Manutention) has published standards specifically for material handling and lifting equipment.

With the creation of the European Union, organizations for standardization were established at different levels of regulatory authority covering numerous product areas.

The highest regulatory level is a European Standards Commission. Its regulations are absolute and regulatory, focusing primarily on worker safety and protection from occupational hazards.

There are three main regulations:

- Machinery Regulation (including Lifting and Material Handling Equipment)
- Low Voltage Electricity Regulation
- EMV - Electro-magnetic Compatibility Regulation

At the next level are CEN (mechanical) and CENELEC (electrical) Standards. They are more detailed and product oriented than the regulations. Per definition, the publications of CEN and CENELEC are "Standards", non-regulatory guidelines, reflecting state of the art design and construction practices. They are based on the highest level of probability that equipment, designed to these standards will be safe and functional. They do not preclude deviations or "product improvement based on technological progress".



The goal of the CEN & CENELEC Committees is to harmonize the new, European norms with existing country-specific norms. The committees responsible for generating new standards include workgroups and sub-committees, which are comprised of representatives of related industries, academia and engineering research, as well as legal counsel. When a new CEN/CENELEC standard is introduced and "HARMONIZED" (language, legal, etc.) national norms (DIN (Germany), BS (England), AFNOR (France), AENOR (Spain), etc) lose validity.

Following is a listing of European standards and specifications for hoists and related equipment:

### BSI STANDARDS

Selection of primary standards published by British Standards (BSI website [www.bsi-global.com](http://www.bsi-global.com)) for hoists and related material handling equipment. (BS EN indicates harmonized standard):

BS EN 292	Safety of Machinery
BS EN 14492-2	Cranes – Power Driven Hoists
BS EN 60034-1	Rotating Electrical Machines: Rating and performance
BS EN 60034-5	Types of Enclosures for Rotating Electrical Machines
BS EN 60204-32	Safety of Machinery – Electrical Equipment of Machines – Part 32: Requirements for Hoisting Machines

### DIN STANDARDS

Selection of primary standards published by the Deutsches Institut für Normung (DIN; website [www.din.de](http://www.din.de)) for application, design, maintenance and safety aspects of hoist and related equipment. (DIN EN indicates harmonized standard):

DIN EN 14492-2	Cranes – Power Driven Hoists
DIN EN 60204-32	Safety of Machinery; Electrical Equipment of Machines; Requirements for Hoisting Machines.
DIN 3051-Sections 1-4	Lifting Ropes; Steel Wires
DIN 15017	Cranes & Hoists; Principles of Motor and Gear Sizing
DIN 15020- Sections 1-2	Hoists; Principles of Rope Reeving
DIN 15061- Sections 1-2	Cranes & Hoists; Grooves for Rope Sheaves & Drums
DIN 15100	Serial Lifting Equipment; Nomenclature
DIN 15400 through DIN 15414	Detailed Aspects of Load Hooks and Bottom Block Construction

CEN/CENELEC and ISO maintain communication between their committees working on related subjects.

FEM is an Industry Association of Material Handling Manufacturers, similar in nature and function to MHIA Product Councils (HMI, CMAA, MMA, etc.). FEM specifications are not regulatory, yet they are widely accepted in the international arena, and usually referred to in the absence of national standards.

## FEM STANDARDS

The Federation Europeenne de la Manutention (FEM; website [www.fem-eur.com](http://www.fem-eur.com)) publishes many standards for hoists and related material handling equipment. Some of the primary ones are:

FEM 1.002	Illustrated Terminology of Heavy Lifting Equipment
FEM 9.811	Rope and Chain Hoists – General Specifications
FEM 9.511	Rules for the Design of Series Lifting Equipment – Classification of Mechanisms
FEM 9.661	Rules for the Design of Series Lifting Equipment – Dimensions and Design of Rope Reeving Components
FEM 9.683	Selection of Hoist and Travel Motors
FEM 9.852	Power Driven Series Hoist Mechanisms, Standardized Test Procedure for Verification of the Classification
FEM 9.755	Measures for Achieving Safe Working Periods for Motorized Serial Hoist Units (S.W.P.)
FEM 9.751	Power Driven Series Hoist Mechanisms, Safety
FEM 9.901	Rules for the Design of Series Lifting Equipment and Cranes Equipped with Series Lifting Equipment

## CEN STANDARDS

Selection of primary standards published by the European Committee for Standardization (CEN; website [www.cenorm.be](http://www.cenorm.be)) for hoists and related material handling equipment:

EN 341	Cranes – Bridge and Gantry Cranes
EN 13135-1	Cranes – Equipment – Part 1: Electrical Equipment
EN 13135-2	Cranes – Equipment – Part 2: Non-electrical Equipment
EN 13157	Cranes – Safety – Hand Powered Cranes
EN 13155	Cranes – Safety – Non-fixed Load Lifting Attachments
EN 13557	Cranes – Controls and Control Stations
EN 14492-1	Cranes – Power Driven Winches and Hoists – Part 1: Power Driven Winches
EN 14492-2	Cranes – Cranes – Power Driven Winches and Hoists – Part 2: Power Driven Hoists
EN 60204-32	Safety of Machinery; Electrical Equipment of Machines; Requirements for Hoisting Machines.

## Auto Lifts



## **Automotive Lift Inspections**

The following document outlines the requirements for automotive lifts as set forth by ANSI/ALI ALOIM-2000 Automotive Lift Institute Standard for Automotive Lifts - Safety Requirements For Operation, Inspection and Maintenance.

### **Operation of Lifts**

1. Owners/employers must ensure that operators of automotive lifts are instructed in the safe use and operation of the lift using the manufacturer provided instructions and warning labels.
2. Owners/employers are required to appropriately document operator training by completing an operator training log. (Appendix A-1)
3. Operators shall operate the automotive lift only **AFTER** being properly trained.
4. Operators shall use all applicable safety features provided on the automotive lift and operate the lift in accordance with the instructions furnished by the lift manufacturer.
5. Operators shall be responsible for maintaining the cleanliness and orderliness of the lift and its surroundings so that the lift may be safely operated.
6. Operators shall conduct a daily inspection of automotive lifts prior to use. Features to be inspected are outlined in Appendix A-2.
7. Lift operators shall become familiar with the vehicle manufacturer's recommended lift points contained in the vehicle shop service manual. Operators should notify their supervisor if there are questions regarding lift points.
8. Operators are required to report any unsafe operating conditions observed before, during or after operation of the lift. The lift must be locked or tagged out until the problem has been determined and qualified automotive lift service personnel have made appropriate repairs.
9. Accessories used by operators on automotive lifts must be manufactured in compliance with ANSI/ALI ALCTV-1998 and shall be applicable for use on the specific lift. No homemade accessories.

### **Periodic Qualified Inspection**

**Note:** Some activities performed during inspections are subject to compliance with established OSHA standards including, but not limited to: personal protective equipment, walking-working surfaces, hazardous materials, lockout/tagout, compressed gas and compressed air equipment and; machinery and machine guarding. Owners/employers are responsible for ensuring compliance with the requirements of the applicable standards.

1. Owners/employers shall establish a periodic inspection procedure in accordance with the recommendations of the lift manufacturer.
2. A "qualified" automotive lift inspector shall have the following qualifications:
  - a) knowledge of personal safety practices necessary to perform routine and periodic inspections;
  - b) familiarity with industry terminology;
  - c) ability to read and understand equipment manuals, drawings and parts lists;
  - d) knowledge of purpose and function of all components, devices and accessories commonly employed on automotive lifts;
  - e) working knowledge of electrical and electronic control circuit principles as applied to the operation of pumps, motors, valves and switches;
  - f) working knowledge of mechanical principles as applied to structures, machines, mechanisms and the effects of traction on ropes, chains and sheaves;
  - g) working knowledge of hydraulic principles as applied to the operation of valves, pumps, cylinders (plungers) and piping;
  - h) working knowledge of pneumatic principles as applied to the operation of valves, compressors, cylinders (plungers), pressure vessels and piping; and
  - i) knowledge of the many and varied types and styles of automotive lifts, their uses, and any limitations or restricted applications.
3. Training for "qualified" inspectors must be achieved through experience in installation or field service work for users, manufacturers, distributors or service organizations for automotive lift products.
4. **Documentation** – a record of each periodic inspection shall be prepared and maintained noting all observations and findings, as well as, all repairs or replacements accomplished. The owner/employer must acknowledge the findings of the inspection by signing the inspection certificate (Appendix A-3).
5. **Frequency** – owners/employers shall follow the recommendations of the manufacturer as to frequency. As a minimum, all inspection points (Appendix A-4) must be checked and documented at least **annually**.

## **Maintenance**

1. Preventative maintenance procedure – owners/employers shall establish a periodic preventative maintenance procedure in accordance with the recommendations of the lift manufacturer.
2. Preventative maintenance personnel qualifications – preventative maintenance technicians shall meet the qualifications of a lift operator, be familiar with and follow the appropriate OSHA standards and possess demonstrated proficiency in the use of tools in the performance of preventative maintenance duties.
3. Preventative maintenance personnel training – personnel qualified to perform preventative maintenance of automotive lifts should be achieved through formal training or experience in automotive lift operation and general equipment maintenance.
4. Preventative maintenance documentation – a thorough record of each preventative maintenance procedure performed shall be prepared and maintained by the owner/employer.
5. Preventative maintenance frequency – preventative maintenance shall follow the recommendations of the lift manufacturer.

## **Repairs**

Repairs should be conducted by qualified service repair technicians.

## **Modifications**

There shall be no modifications or reconstruction made to any automotive lift without the express written permission of the manufacturer.

## **Disclaimer**

The points listed are a summary of the ANSI/ALI ALOIM-2000 Automotive Lift Institute Standard for Automotive Lifts - Safety Requirements For Operation, Inspection and Maintenance and are not written verbatim. A full version of the standard is available from the Automotive Lift Institute at:

Automotive Lift Institute, Inc.  
PO Box 33116  
Indialantic, FL 32903-3116

TEL: 321-722-9993  
FAX: 321-722-9931  
EMAIL: [autolift@iu.net](mailto:autolift@iu.net)

### Operator Training Log

Employer: \_\_\_\_\_

Operator: \_\_\_\_\_

Employee #: \_\_\_\_\_

Lift  
Manufacturer: \_\_\_\_\_

Lift Model: \_\_\_\_\_

Serial No: \_\_\_\_\_

Lift Capacity: \_\_\_\_\_

Operator qualifications: \_\_\_\_\_

Training received:

Manufacturer's Instructions ☐

Warning Labels ☐

"Lifting It Right" Video ☐

Lifting Point Guide ☐

Safety Tips ☐

Notes: \_\_\_\_\_

I certify that I possess the qualifications for an automotive lift operator and that I have received the required training to operate the lift.

\_\_\_\_\_  
Operator Signature

\_\_\_\_\_  
Date

I certify that the operator shown above possesses the qualifications to be an automotive lift operator and has received the required training.

\_\_\_\_\_  
Supervisor Signature

\_\_\_\_\_  
Date



**Operator Daily Lift Inspection Checklist**

Operator: Review all items prior to use of the lift.

<b>No.</b>	<b>Lift Checkpoint</b>	<b>OK</b>	<b>Fix</b>	<b>Comments</b>
1	Accessibility and readability of the operating procedures, safety tips and generic safety material			
2	Accessibility and readability of safety warning labels			
3	Readability of the rated load capacity			
4	Proper operation of the lift controls, restraints and locking devices			
5	Deformation or excessive wear of any of the lift structural components			
6	Deformation or excessive wear of other components such as hoses, electrical wires, drive chains, cables or screws			
7	Damage or excessive wear on any of the lift contact points which engage the vehicle during lifting			
8	Evidence of hydraulic or pneumatic leaks			
9	Unusual noises, sudden movements, erratic operation or evidence of chips or filings during use			
10	Cracks or loose concrete around floor anchor bolts, if employed			

### Inspection Certificate

Lift Owner/Employer: \_\_\_\_\_

Qualified Inspector Name: \_\_\_\_\_

Qualified Inspector Company: \_\_\_\_\_

Lift Manufacturer: \_\_\_\_\_

Lift Model: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Lift Capacity (pounds): \_\_\_\_\_

**Lift Type:**

Hydraulic ☐  
Mechanical ☐

Hydraulically driven mechanical ☐  
Pneumatic ☐

**Inspection Points**

Attach checklist furnished by manufacturer or equivalent checklist from ALI ALOIM-2000 indicating the observations and findings of all points of inspection recommended by the manufacturer, any adjustments made and parts replaced.

I certify that I meet the requirements of ALI ALOIM-2000 paragraph 5.2 for qualified lift inspector and that I have successfully completed the training for qualified lift inspector as described in ALI ALOIM-2000 paragraph 5.3.

\_\_\_\_\_  
Inspector Signature

\_\_\_\_\_  
Date

*This inspection is not intended as a guarantee against failure or malfunction. Its purpose is to verify that the lift has been maintained in a reasonable and safe manner and that the supporting documents supplied by the manufacturer are accessible to the operator to assist in the safe operation of the lift and to call attention to repairs that may be needed to correct existing or potential malfunctions where such can be determined by visual and ordinary examination methods. No liability for the use, operation, management or control of this lift is assumed by the inspector or the inspector's company.*

\_\_\_\_\_  
Owner/employer Signature

\_\_\_\_\_  
Date

**Maintain this inspection certificate with records pertaining to the lift.**

### **Periodic Inspection Checklist**

This checklist is to be used for all automotive lifts and for accessory wheels-free devices employed on lifts with runway superstructures. Use supplementary periodic inspection checklists for specific automotive lift classes.

#### **Inspection Points – All Lifts (5.6.2)**

1. Record location of manufacturer instructions or generic instructions.
2. Check accessibility and readability of safety warning labels.
3. Record rated load capacity of the lift.
4. Record manufacturer name, model number and serial number.
5. Confirm adequacy of clearances around lift.
6. Examine all structural components including welds.
7. Examine electrical components and wiring.
8. Check the lift controls.
9. On lifts using runways, check to ensure proper operation of all features.
10. On lifts using swing arms, check telescoping stops.
11. On lifts requiring swing arm restraints, check for proper function.
12. Check all fastening devices for tightness including floor anchor bolts.
13. Check exposed surfaces and edges.
14. Operate the lift and check the operation of the positive stop and the lift locks.
15. On lifts employing adapters, check condition and proper operation.
16. With a representative vehicle on the lift check the lowering speed.
17. Check all points requiring lubrication.
18. On lifts equipped with lateral synchronization or equalization systems, check the operation of the systems.

19. On lifts incorporating working platforms, railings and stairways, check the railings and the walking surfaces.
20. On lifts incorporating overhead structures, verify the safety shutoff.
21. Inspect all cables and chains.
22. Check the tracking and level winding of cables and chains.
23. Report unguarded pinch points.
24. Confirm single point operation of multiple powered posts.
25. Report water in sub-floor pits or enclosures.

**Supplemental Inspection Points**  
**Hydraulic and Hydraulically Driven Mechanical Lifts (5.6.3)**

1. Check all accessible piping, tubing, hose, valves and fittings. Review lift oil consumption records.
2. Operate lift through full excursion and observe.
3. With lift loaded, stop the load at midpoint of travel and observe.
4. Check with operator to ascertain any unusual operation characteristics.
5. On lifts which incorporate trench covers, verify the proper operation.
6. On air-oil lifts check for low oil control.
7. Confirm cylinder venting provisions.
8. Confirm rotation prevention device on single post lifts.
9. On lifts utilizing pumping units, confirm adequacy of oil level at fully raised position.

**Supplemental Inspection Points**  
**Mechanical and Hydraulically Driven Mechanical Lifts (5.6.4)**

1. Check for the proper operation of the slack suspension cable or slack suspension chain sensing system.
2. Check the operation of the screw drive systems. Check for proper lubrication.
3. Check screw drive systems for proper operation of the follower or safety nut.

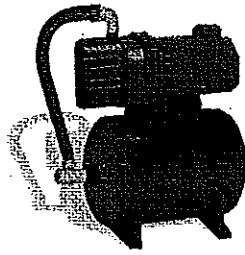
4. Run the lift through its full cycle and check for shut off at top and bottom of travel. Check the operation of multiple screw systems.
5. On mobile wheel engaging lifts, check the mobility of the individual units.

**Supplemental Inspection Points**  
**Pneumatic Lifts (5.6.6)**

1. Check all accessible piping, tubing, hose, valves and fittings for leaks.
2. With lift loaded, stop the load at midpoint of travel and observe.
3. Check with operator to ascertain any unusual operating characteristics.
4. Confirm presence of pressure regulator in supply line.
5. Inspect air bag or bellows for damage.

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## Air Compressors



**U.S. Department of Labor**  
Occupational Safety & Health Administration[www.osha.gov](http://www.osha.gov)Search  [Advanced Search](#) | [A-Z Index](#)**Regulations (Standards - 29 CFR)****Air receivers. - 1910.169** [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

• <b>Part Number:</b>	1910
• <b>Part Title:</b>	Occupational Safety and Health Standards
• <b>Subpart:</b>	M
• <b>Subpart Title:</b>	Compressed Gas and Compressed Air Equipment
• <b>Standard Number:</b>	<u>1910.169</u>
• <b>Title:</b>	Air receivers.

**1910.169(a)**

## General requirements -

**1910.169(a)(1)**

Application. This section applies to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. On the other hand, however, this section does not deal with the special problems created by using compressed air to convey materials nor the problems created when men work in compressed air as in tunnels and caissons. This section is not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

**1910.169(a)(2)**

## New and existing equipment.

**1910.169(a)(2)(i)**

All new air receivers installed after the effective date of these regulations shall be constructed in accordance with the 1968 edition of the A.S.M.E. Boiler and Pressure Vessel Code Section VIII, which is incorporated by reference as specified in Sec. 1910.6.

**..1910.169(a)(2)(ii)****1910.169(a)(2)(ii)**

All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, Section VIII Edition 1968.

**1910.169(b)**

## Installation and equipment requirements -

**1910.169(b)(1)**

[http://www.osha.gov/pls/oshaweb/owadis.show\\_document?p\\_table=STANDARDS&p\\_id=9823](http://www.osha.gov/pls/oshaweb/owadis.show_document?p_table=STANDARDS&p_id=9823)

**Air receivers. - 1910.169**

Installation. Air receivers shall be so installed that all drains, handholes, and manholes therein are easily accessible. Under no circumstances shall an air receiver be buried underground or located in an inaccessible place.

**1910.169(b)(2)**

Drains and traps. A drain pipe and valve shall be installed at the lowest point of every air receiver to provide for the removal of accumulated oil and water. Adequate automatic traps may be installed in addition to drain valves. The drain valve on the air receiver shall be opened and the receiver completely drained frequently and at such intervals as to prevent the accumulation of excessive amounts of liquid in the receiver.

**1910.169(b)(3)**

Gages and valves.

**1910.169(b)(3)(i)**

Every air receiver shall be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent.

**..1910.169(b)(3)(ii)****1910.169(b)(3)(ii)**

No valve of any type shall be placed between the air receiver and its safety valve or valves.

**1910.169(b)(3)(iii)**

Safety appliances, such as safety valves, indicating devices and controlling devices, shall be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements.

**1910.169(b)(3)(iv)**

All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.

[39 FR 23502, June 27, 1974, as amended at 49 FR 5322, Feb. 10, 1984; 61 FR 9227, March 7, 1996]

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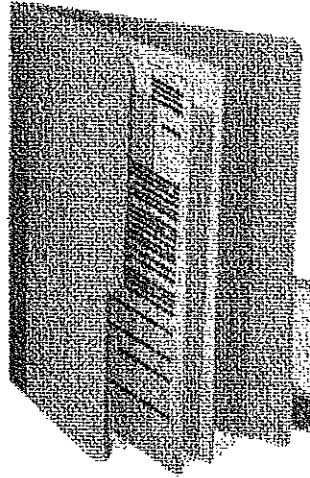
**■ COMPRESSORS AND COMPRESSED AIR**

- Are compressors equipped with pressure relief valves and pressure gauges?
- Are compressor air intakes installed and equipped so as to ensure that only clean, uncontaminated air enters the compressor?
- Are air filters installed on the compressor intake?
- Are compressors operated and lubricated in accordance with the manufacturer's recommendations?
- Are safety devices on compressed air systems checked frequently?
- Before a compressor's pressure system is repaired, is the pressure bled off and the system locked out?
- Are signs posted to warn of the automatic starting feature of the compressors?
- Is the belt drive system totally enclosed to provide protection for the front, back, top and sides?
- Are employees strictly prohibited from directing compressed air towards a person?
- Are employees prohibited from using highly compressed air for cleaning purposes?
- When compressed air is used to clean clothing, are employees trained to reduce the pressure to less than 10 pounds per square inch (psi)?
- When using compressed air for cleaning, do employees wear protective clothing and PPE?
- Are safety chains or other suitable locking devices used at couplings of high-pressure hose lines where a connection failure would create a hazard?
- Before compressed air is used to empty containers of liquid, is the safe working pressure of the container checked?
- When compressed air is used with abrasive blast cleaning equipment, is the operating valve a type that must be held open manually?
- When compressed air is used to inflate auto tires, are a clip-on chuck and an inline regulator preset to 40 psi required?
- Are employees prohibited from using compressed air to clean up or move combustible dust if such action could cause the dust to be suspended in the air and cause a fire or explosion hazard?

**COMPRESSORS/AIR RECEIVERS**

- Is every receiver equipped with a pressure gauge and one or more automatic, springloaded safety valves?
- Is the total relieving capacity of the safety valve able to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent?
- Is every air receiver provided with a drain pipe and valve at the lowest point for the removal of accumulated oil and water?
- Are compressed air receivers periodically drained of moisture and oil?
- Are all safety valves tested at regular intervals to determine whether they are in good operating condition?
- Is there a current operating permit?
- Is the inlet of air receivers and piping systems kept free of accumulated oil and carbonaceous materials?

**Equipment Inspection Record**  
**(blank original)**



**Equipment Inspection Record**

ATC:	Program:	Instructor:
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Equipment inspections are to be done according to the Documentation Criteria and as individual equipment manuals indicate.

[illegible]

